Washington Medical Center, and Veterans Affairs Puget Sound Healthcare System were eligible. Presence of a clonal IgH rearrangement, t(11;14) by PCR or positive flow cytometry from blood or bone marrow prior to transplant was scored as MRD positive. MRD along with clinical factors were evaluated in an adjusted proportional hazards model for associations with progression-free (PFS) and overall survival (OS).

Results: Seventy-five transplanted MCL patients in CR had pretransplant MRD evaluation performed. The median age was 58 years (range, 38-71), 59 (78.7%) were men, the median number of prior regimens was 1 (range 1-4), and the median MIPI score was 2 (range 0-7). Induction chemotherapy consisted of HyperCVAD in 37 (49.3%), CHOP in 36 (48%), CVP in 1(1.3%), and Cytoxan in 1 (1.3%). Rituximab was administered to 63 (84%) as part of their pretransplant regimen. Eight patients (11%) had evidence of MRD. Positive MRD tests included: t(11:14) only in 4 (50%), flow only in 2 (25%), and flow and t(11;14) PCR positive in 2 (25%). Sites of MRD included bone marrow in 5 (62.5%) and peripheral blood in 4 (50%). MRD positivity was highly associated with both OS and PFS in unadjusted and adjusted models (Figure 1). With a median follow-up of survivors of 5.1 years, the median OS for MRD negative patients was not reached, while for the MRD positive patients was 3.01 years (hazard ratio [HR] 4.04, p = 0.009). The median PFS for MRD negative patients was not reached, while for the MRD positive patients was 2.38 years (HR 3.69, p = 0.002).

Discussion: These data indicate that MRD positivity is independently associated with poor outcome following ASCT for MCL patients despite achieving a clinical CR. New treatment strategies such as post-transplant maintenance regimens or reduced intensity allogeneic transplantation could be evaluated in this setting in an attempt to improve remission durations and survival.

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Comparison of Fludarabine, Intravenous Busulfan, and Total Body Irradiation (FluBuTBI) to BEAM As Conditioning Regimens for Autologous Peripheral Blood Stem Cell Transplantation in Non-Hodgkins Lymphoma

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Objective: To compare the outcome of patients with Non-Hodgkins Lymphoma undergoing autologous peripheral blood stem cell transplantation (PBSCT) conditioned with FluBuTBI or BEAM (BCNU, Etoposide, Cytarabine, and Melphalan) at our institution.

Patients and Methods: We conducted a retrospective analysis of patients (n=81) who underwent autologous PBSCT at our institution and were conditioned with BEAM (n=40) or FluBuTBI (n=41) between January 2006 and January 2013. Recipients were classified according to CIBMTR criteria and those conditioned with BEAM were low risk (n=14) and intermediate risk (n=26). Recipients conditioned with FluBuTBI were low risk (n=10), intermediate risk (n=27) and high risk (n=4). Median age of patients in the BEAM group was 57.2 years compared to 59.6 years for FluBuTBI. At the time of transplantation, 25 of 40 patients who received BEAM were in complete remission (62.5%) compared to 21 of 41 patients (51.2%) for FluBuTBI. Median time of follow up was 57 months for BEAM and 30.2 months for FluBuTBI.

FluBuTBI consisted of intravenous (IV) Fludarabine 50 mg/m^2/day infused over 1 hour on days -6 through -2, IV Busulfan 3.2 mg/kg/day on days -5 through -2 (infusion rate 80 mg/hour) and TBI 200 cGy on days -2 and -1. BEAM regimen consisted of IV BCNU 300 mg/m^2 infused over 1 hr on day -5, Etoposide 200 mg/m^2/day over 3 hours on days -5 through -2, Cytarabine 200 mg/m^2/day over 1 hour every 12 hours on days -5 through -2, and Melphalan 140 mg/m^2 over 1 hr on day -1. Diagnoses were transformed follicular lymphoma (n=1), composite lymphoma (n=1), CLL (n=1), anaplastic large cell lymphoma (n=2), B-cell lymphoma NOS (n=3), Burkitt's lymphoma (n=3), peripheral T-cell lymphoma (n=5), follicular lymphoma (n=16), mantle cell lymphoma (n=23), diffuse large B-cell lymphoma (n= 26).

Results: Overall survival (OS) at 3 years for the FluBuTBI group was 76.2% compared to BEAM at 57.5%. Cumulative incidence of disease progression at 3 years was 24.5% for FluBuTBI compared to 45% for BEAM group (p=0.039). Relapse related mortality (RRM) at 3 years for FluBUTBI was 8.7% compared to 32.4% for the BEAM group (p=0.012). Treatment related mortality was observed in 2.5% (n=1) in the BEAM group while none in the FluBuTBI group. Treatment related MDS/AML occurred in 2.4% (n=1) in FluBUTBI compared to 7.5% (n=3) in the BEAM group. Grade 3-4 mucositis was seen in 14.6% (n=6) in the FluBuTBI group while not observed in the BEAM group.

Conclusion: Our institutional data showed better OS and less RRM in the FluBuTBI group compared to BEAM as conditioning regimen for Non-Hodgkins Lymphoma undergoing Autologous PSCT. This difference was present despite older and higher risk patients in the FluBuTBI group. Mucositis was more frequent in the FluBuTBI group. Conditioning with FluBuTBI is a safe and effective alternative to BEAM for autologous PBSCT which needs to be validated by randomized prospective studies.

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Algorithm for Administration of Plerixafor Pre-Apheresis for Adult Autologous Stem Cell Transplantation

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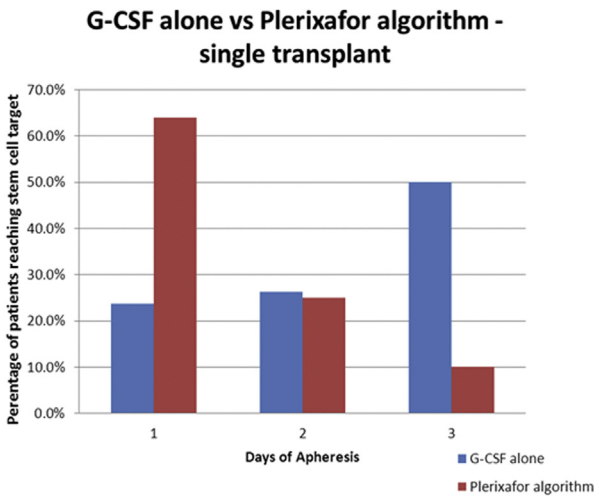
Background: The use of plerixafor can decrease the number of apheresis collection days for a given patient, which in turn reduces cost and other various resources. An algorithm was developed at our facility based on the paper published by LJ Costa in 2010 to predict the need for plerixafor on day four of G-CSF mobilization.

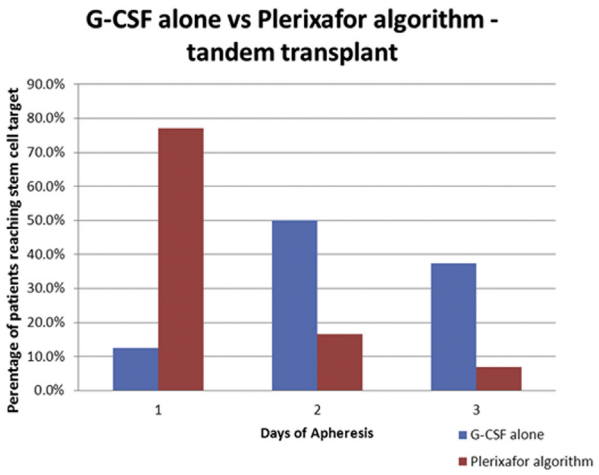
Methods: Peripheral blood is drawn on day four of G-CSF mobilization (10μg/kg) for CD34 enumeration (pretube) using the single-platform ISHAGE method. If the value is <14 CD34/μL for a single transplant or <25 CD34/μL for a tandem transplant the transplant recipient will receive plerixafor (0.24mg/kg). If a patient does not qualify for plerixafor on the day previous to apheresis and does not collect all CD34/kg required on day one they receive plerixafor for day two of apheresis. This algorithm is used for all autologous transplant disease types treated at our facility (multiple myeloma, non-Hodgkin lymphoma, Hodgkin lymphoma, and germ cell) and is not adjusted for age, gender, performance status, etc. except under the direction of the medical director. Our targets for stem cell collection are 3.0x10^6 CD34/kg for a single transplant and 6.0x10^6 CD34/kg for tandem transplants.

Results: From 2007-2009 we had a total of 110 apheresis collections (38 patients) for a single transplant with an average of 2.5 collection days per patient using G-CSF alone. 23.7% (n=9) of our patients collected in one day, 26.3%

(n=10) collected in two days, and 50% (n=19) collected in three or more days. There were 28 tandem transplant collections (8 patients) with an average of 2.9 days of apheresis collection per patient. 12.5% (n=1) of our patients had one day of collection, 50% (n=4) had two days and 37.5% (n=3) had three or more days of apheresis. Plerixafor was first given in 01/2009 and until 07/2010 our patients received the drug based on insurance approval or as a second line of therapy after collection failure. Our algorithm was implemented starting 03/2011 and to date for a single transplant we have had 109 collections (67 patients) with an average of 1.7 days of collection per patient. 64% of patients (n=43) collected in one day, 25% (n=17) collected in two days and 10% (n=7) collected in three or more days. There were 42 tandem transplant collections (30 patients) with an average of 1.5 days of apheresis collection per patient. 77% (n=23) of our patients collected in one day, 16.7% (n=5) collected in two days and 7% (n=2) collected in three or more days (see Figures 1 and 2). There is a significant difference between the number of collection days needed for patients that received G-CSF alone and the collection days needed for patients evaluated with our algorithm ($p<0.001$).

Conclusion/Summary: The addition of an algorithm for the use of plerixafor has significantly reduced the number of collections needed per patient, which in turn reduces cost and resources.





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Bortezomib-Based Induction Therapy PRIOR to High Dose Melphalan and Autologous Hematopoietic CELL Transplantation in Primary Amyloidosis

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High-dose melphalan followed by autologous hematopoietic cell transplant (AHCT) can improve long-term outcome of patients with primary amyloidosis. Historically, it has been associated with high transplant related mortality (TRM). However, improvement in patient selection has resulted in decreased TRM and improved outcomes. The most common approach, if patients are determined to be eligible, is to proceed directly to ASCT. However, at our institution, patients uniformly receive bortezomib-based induction therapy to obtain best response prior to transplant. We performed a retrospective analysis to evaluate the outcomes of AL amyloidosis patients undergoing ASCT at our institution.

From 6/2007 to 3/2014, 24 patients underwent AHCT, receiving either melphalan 200mg/m2 or 140mg/m2 as a single dose. The median age at transplant was 60 years (range 35 to 72), with 54% male patients. Karnofsky Performance Status was 80% or higher in 87% of patients. Only 13% had known cardiac involvement. All patients had normal troponin levels and the median NT-pro-BNP 253 (range 62 to 7580). The majority of patients had either intermediate (21%) or high (47%) risk co-morbidity index scores. The median time from diagnosis to transplant was 8.3 months, with the majority of patients receiving at least 1 line of prior therapy (92%). For disease response, following induction therapy, 58% were transplanted in first complete response (CR) or partial response (PR), 8% in second PR, and 33% with refractory disease. Patients were mobilized with either G-CSF alone (79%), G-CSF + plerixafor (17%), or G-CSF + cyclophosphamide